

# Radiation: Registration of Sources

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THE CALIFORNIA STATE Department of Public Health has been and will be actively concerned and involved in any radiation protection activities within the State, in that the Department has general responsibility and broad authority under the Health and Safety Code to protect the public health and safety. It also has the authority to investigate any conditions or circumstances which might affect the public health. Until recently, having no legislative directive for a broader one, the Department had been carrying on a limited radiation protection program. The activities included a limited environmental monitoring program to measure and evaluate the extent of radioactive fallout, the listing and distribution to other state agencies of Atomic Energy Commission (AEC) licenses in the State, limited studies of the extent of employee and general population exposure incident to the industrial uses of radiation, the evaluation of the use of radioactive tracers in studies such as stream and ground water measurements, and, on occasion, consultation to medical, dental and industrial users of radiation-producing machines and radioactive materials.

The Department's activities with regard to radiation protection were expanded in 1959 with the provision of a budget for additional personnel and equipment principally to expand the program of detection and evaluation of contamination of the environmental air, water, food and soil incident to radioactive fallout.

The California State Legislature in the 1959 session passed a bill which added Chapter 7.5 to Division 20 of the Health and Safety Code. This chapter is titled "California Atomic Energy Development and Radiation Protection Law."

Article 2 of the chapter is a declaration of policy:

25710. The Legislature finds and declares that the peacetime uses of atomic energy and radiation can be instrumental in improving the health, welfare and economic productivity of the people of the State of California if properly utilized, and may be hazardous to the health and safety of the public if carelessly or excessively employed. It is therefore declared to be the policy of the State to:

(a) Encourage the constructive development of industries producing or utilizing atomic energy and radiation and to eliminate unnecessary exposure of the public to ionizing radiation.

(b) Have state agencies retain their traditional jurisdictions wherever possible.

• Registration of sources of ionizing radiation, including x-ray machines and radioactive material used in the healing professions, is required by legislation recently enacted in California. Registration will provide information concerning the type and location of sources of radiation, and will provide a basis for the evaluation of a need for additional radiation control and protection measures in the future.

As the medical uses of radiation procedures constitute a major portion of the total radiation exposure to the total population, it becomes increasingly important that physicians develop a reasonable and knowledgeable concept of not only the obvious benefits but also the actual and potential hazards of radiation as used in medicine. Practical and effective measures to minimize patient exposure, based on professional knowledge, competence and experience, with profession-wide participation and support, will insure the effective integration of the medical uses of radiation in the California Atomic Energy Development and Radiation Protection Program.

(c) Have various departments and agencies of the State which are concerned with atomic energy and radiation and its various applications develop programs designed to protect the people of the State from unnecessary exposure to radiation.

(d) Assure the coordination of the programs of the state agencies and the laws, rules and regulations incident thereto and to insure the coordination of these activities with the development and regulatory activities of local agencies, other states and the Government of the United States, including the Atomic Energy Commission.

Article 4 establishes in the Office of the Governor the position of Coordinator of Atomic Energy Development and Radiation Protection, and sets forth his duties and responsibilities. In general terms, the legislation directs that the Coordinator shall, with respect to atomic energy development and radiation protection, serve as advisor to the Governor, perform the liaison function between the state and federal governments, coordinate the programs and rules and regulations of state, city, and county agencies, keep the Governor and various state, city and county agencies informed and enlist their cooperation in protecting the health, safety and general welfare of the people of the State, and disseminate to the public factual data and information and interpretations thereof. The legislation further directs that the Coordinator shall submit a report to the Governor and the Legislature not later than ten calendar days following the commencement of each regular session of

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the Legislature, recommending such action or legislation as he deems necessary or desirable, and shall submit his first report to the Governor and the Legislature at the 1961 regular session, including but not limited to information and recommendations on:

(a) The environmental monitoring and surveillance program of the State relating to radiation.

(b) The adequacy of the radiological laboratory facilities of the State necessary for discharging the duties and performing the service required by state agencies, whether or not there should be a centrally located laboratory facility to service all state agencies, and if so where it should be located administratively, or whether it would be feasible for the State to contract with private organizations for any needed technical laboratory work.

(c) The need for a program for the inspection of sources of radiation within the State.

The Coordinator may consult with and seek the advice of technically qualified persons within and without the State to advise on matters relating to atomic energy and radiation protection, particularly with regard to rules, regulations and safety standards relating to radiation usage and exposure.

Alexander Grendon has been appointed and is serving as Coordinator in the office of the Governor at Sacramento.

Article 5 establishes in the State government the Departmental Coordinating Committee on Atomic Energy Development and Radiation Protection which shall consist of the Coordinator as chairman and the heads of the appropriate and interested state departments and agencies. The committee shall assist in the coordination and development of programs and activities pertaining to atomic energy development and radiation protection, and shall report thereon to the Governor.

Article 6 establishes in the State government an Advisory Council on Atomic Energy Development and Radiation Protection, consisting of the Coordinator and nine members appointed by the Governor, one each from industry, labor, medicine, education, science and technology, agriculture, insurance, city government and county government. The council shall evaluate the programs of the several state departments and agencies and advise and make recommendations to the Governor bearing on the development of state policy in the field of atomic energy development and radiation protection.

Article 7 makes it unlawful for any person to manufacture, construct, produce, transfer, acquire, use or possess any of the materials or facilities for which a permit or license is required under the provision of the Atomic Energy Act of 1954 (Public Law 85-256), unless he shall have first obtained such license. It also requires the State Department of Public Health to keep current information on the permits and licenses issued by the United States

Atomic Energy Commission in the State, and to transmit such information to the Coordinator and, upon request, to any state department or agency or member of the public.

Article 8 entitled "Registration of Sources of Radiation" is quoted directly as follows:

25780. Any person possessing a source of radiation shall register with the Department of Public Health pursuant to rules and regulations which shall be promulgated by the Board of Public Health and shall give such information relating to such source of radiation as shall be required by such rules and regulations on forms to be prescribed by the Board of Public Health and furnished by the department. Violation of this section is a misdemeanor.

25781. The information obtained by registrations under Section 25780 shall be transmitted by the department to the Coordinator of Atomic Energy Development and Radiation Protection and shall be made available to state departments and agencies, city and county governments, and the public.

Assembly Bill 1403 became effective on September 18, 1959. The State Department of Public Health is now actively engaged in developing the rules, regulations and forms for registration of sources of ionizing radiation in consultation with professional societies and activities and other state and local agencies for consideration by the State Board of Public Health. It is estimated that these will not be adopted or available for distribution for several months. When available, the regulations and forms will be distributed through proper channels. As registration applies to all sources of ionizing radiation, all physicians and allied professional users of diagnostic and therapeutic x-ray machines and radium, and most AEC licensees who use by-product material for diagnosis and treatment must register. Registration will also apply to industrial and commercial users.

With the implementation of the new California Atomic Energy Development and Radiation Protection Law, the activities and responsibilities of the Department will be greatly expanded. The Department will be concerned with the public health aspects of ionizing radiation from all sources including natural background, the environmental contamination incident to fallout, nuclear power installations, radioactive waste disposal and occupational exposure. The Department will also be concerned with the public health aspect of the patient exposure incident to uses in diagnosis and therapy.

The somatic hazard to the individual and the genetic hazard to the future population as a whole from any source or amount of ionizing radiation is generally acknowledged. It is generally believed that the genetic hazard is the more significant. The amount of genetically significant radiation contributed by medical exposure of patients is most difficult to measure or estimate, but it is generally agreed that medical uses contribute an amount equal to the natural background dose and that radioactive fall-

out and occupational exposure in radiation industries each contributes less than 5 per cent of the dose from either medical uses or natural background. It is apparent that the medical exposure of patients is potentially of major importance. It is generally agreed that the amount thus received can be significantly lowered by reasonable and practical measures without in any manner decreasing the obvious benefits to patients and society as a whole. This can be accomplished by profession-wide recognition of the actual or potential hazards of radiation, by the use of good equipment and good practice, and by limitation of the numbers and types of procedures to the actual demands of the medical situation.

The registration of sources of ionizing radiation with the State Department of Public Health will serve primarily as a source of information concerning the number, types and locations of sources. The registrant "shall give such information relating to such source of radiation as shall be required by such rules and regulations on forms to be prescribed by the Board of Public Health and furnished by the Department." Information concerning the extent and status of any radiation control measures currently employed by each registrant at the time of registration would be of great future value in evaluating the need for any expansion of the present radiation protection program of state and local government agencies, to include standards of equipment, shielding, etc. Such information might include data concerning the use of filters and collimating devices to minimize patient exposure, and the use of protective screens, primary shielding in walls and individual monitoring devices. Information of this type would be of value to the state agencies and the Coordinator in the required future recommendations to the Governor and the Legislature concerning the need for a program for the inspection of sources of ionizing radiation within the State.

The Division of Industrial Safety of the California State Department of Industrial Relations administers and enforces laws and safety orders relating to the life and safety of workers in places of employment, including the hazards of ionizing radiation to employees. These orders do not apply to patients, but do apply to those employees of physicians and hospitals who might be exposed to potentially injurious levels of ionizing radiation. The safety orders pertaining to the hazards of radioactivity and ionizing radiation to employees are published as Title 8, Group 6, Article 53, California Administrative Code. These safety orders, adopted in 1950 and amended in 1955, establish minimum standards for protection of employees, and specify maximum permissible exposure limits for employees. The safety orders establish requirements in protective measures

such as the monitoring of workrooms where radioactive material is handled, and the inspection and survey of radiation-producing equipment.

The Atomic Energy Commission has published regulations which establish general standards for protection of licensees, their employees and the general public against radiation hazards arising out of the possession or use of special nuclear material (source or by-product) under license issued by the Atomic Energy Commission. Physicians licensed by the AEC must comply with the regulations and are subject to inspections and enforcement provisions.

The National Bureau of Standards handbooks relating to radiation, particularly Nos. 51, 59, 60, 69, set forth the recognized standards of radiation protection measures as they apply to equipment design, to equipment maintenance, to shielding of walls and to the maximum permissible doses for employees and for the general population outside of but in the vicinity of controlled radiation areas. The standards are published as a guide. However, most "standards" and "codes" relating to radiation protection as actually adopted by official agencies of the federal government and many states are based on and comply with the recommendations of the National Committee on Radiation Protection and Measurements. The publications listed do not apply to radiation intentionally applied to patients.

Since the question of patient exposure to radiation has come to the fore as a matter of general public and professional concern, numerous articles on the subject have appeared not only in the professional medical publications but also in allied scientific publications and in popular magazines. Many of them have attempted to evaluate the extent of any potential or actual health hazard from the careless or unnecessary use of radiation procedures. Numerous other articles, many of which have been published in radiology journals, have discussed such measures as limitation of the beam and refinement of procedure techniques as a way to reduce "unnecessary exposure of the patient." It appears to be particularly essential at this time that all members of the medical, dental and allied professions, whether prescribing, requesting or actually conducting diagnostic or therapeutic x-ray procedures be reasonably familiar with the general subject of ionizing radiation so that they may better judge whether the apparent or expected benefits of any radiation procedure will justify the recognized hazard of the procedure. Medical practice based on reasonable information and on practical scientific protective measures appears to be a prerequisite to a sound radiation control program, whether voluntary or regulatory.

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